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(54) ENGAGING ELEMENT OF A LEVER-TYPE FASTENING DEVICE OF A SPORTS FOOTWEAR

(57) The present invention regards an engaging element (6) of a lever-type fastening device (1) of a sports footwear comprising a rack (6) consisting of an elongated body (60), extending between a first and a second end portion (61, 62) and provided with an engaging toothing (6A) comprising a plurality of teeth that are selectively engageable by a hooking element (5) of said lever-type fastening device (1) to fasten said sports footwear. In particular, said engaging element (6) also comprises a locking means (7) formed by a substantially thread-like

element bent or formed essentially as a U-shaped element and articulated to said rack (6), said locking means (7) being suitable to be rotatably moved between a lowered position, in which it extends around the body (60) of said rack (6) surrounding it at least partly, and lower with respect to said toothing (6A) so as not to interfere with said hooking element (5), and a raised position, in which it is suitable to cooperate with said hooking element (5) to detain it in a desired position.

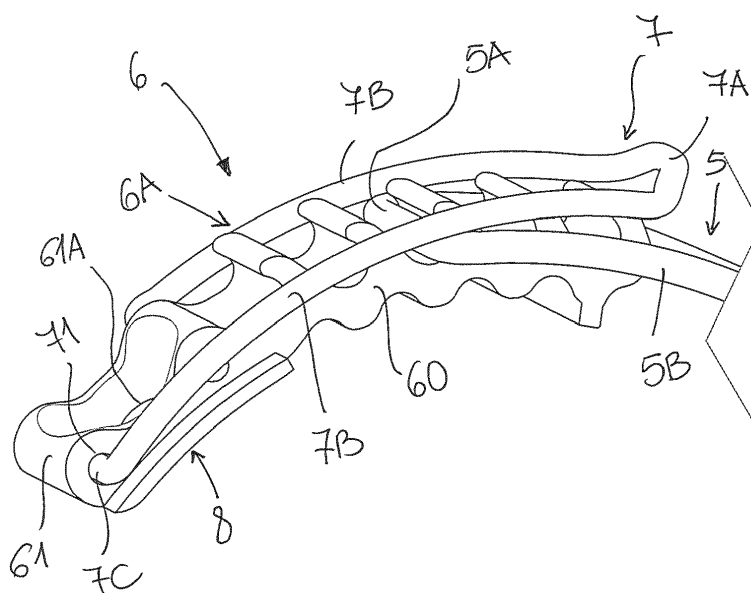


FIG. 7

Description

TECHNICAL FIELD OF THE INVENTION

[0001] . The present invention regards an engaging element of a lever-type fastening device, in particular a rack for a lever-type fastening device for sports footwear, such as for example ski or snowboard boots, motorcycling boots, skating boots or similar.

[0002] . In particular, the present invention regards a rack capable of maintaining in a stable and secure manner the walking, or ski-walk, configuration of a fastening device for sports footwear on which it is fitted.

PRIOR ART

[0003] . Fastening devices suitable to join and fasten two opposite flaps of a footwear are well-known in the sports footwear field; generally, they comprise a lever arm associated with a first flap to fasten which is operatively connected, through a pivoted tension member, to a hooking element, such as a ring or a hook, suitable to interact with a corresponding engaging element, such as a rack fixed to a second flap to fasten so as to achieve the fastening of the footwear.

[0004] . In particular, said rack comprises a sequence of evenly spaced teeth that are selectively engageable by said hooking element to adjust the fastening force on the footwear, based on the requirements of the user, while adapting to the different shapes and sizes of the user's foot.

[0005] . The selection of the engaging position of the hooking element on the rack can be made when the lever arm is in an idle position, that is, detached from the surface of the footwear. When the most suitable position is selected, the fastening of the footwear is achieved in a conventional manner by rotatably moving the lever arm to a tensioning position, in which it lies substantially adjacent to the surface of the footwear.

[0006] . It is important that said devices can guarantee a high fastening level during the actual sport practice so as to achieve an immediate and optimum force transmission, while however they can be loosened to allow the cuff to oscillate and thus facilitate the walking of the user during pauses in the sport activity, that is, when not actually wearing the skis.

[0007] . Normally, the walking condition, known in the sports jargon as ski-walk condition, is achieved by rotating the lever arm to the idle position and engaging the hooking element on one of the last teeth on the rack, that is, those placed nearest to the lever arm and then returning the lever arm to the tensioning position. In fact, it is preferable that even in the walking configuration, the lever arm does not protrude from the surface of the footwear, and thus it is not exposed to impacts that could damage the fastening device.

[0008] . One problem that can be seen in particular when the fastening device is set in the walking configuration

lies in the fact that the vibrations that are generated when the user walks could cause the disengagement between the hooking element and the corresponding rack tooth, thus resulting in the unwanted opening of the sports footwear.

[0009] . To solve this problem, clamping devices are available that comprise a locking element, for example formed by a cover or a rigid band, rotatably connected to the body of the rack and arranged so as to lie, in the idle position, above the toothing of the rack; this locking element is in fact suitable to keep the hooking means firmly engaged in the set position, both during actual skiing and in the walking condition, since they can be raised with respect to the toothing, in opposition to elastic biasing means, to allow the disengagement of the hooking means or the adjustment of their position.

[0010] . However, due to its position above the toothing of the rack, this locking element must frequently be rotatably moved, thus becoming more susceptible to breakages.

[0011] . Moreover, its use is rather inconvenient, in particular if the user is wearing snow gloves.

SUMMARY OF THE INVENTION

[0012] . The main objective of the present invention is to overcome the shortcomings of the prior art by providing an engaging element of a fastening device for sports footwear, in particular a rack, that makes it possible to stably and securely maintain the walking configuration of the fastening device that embodies it.

[0013] . In the scope of the above objective, one purpose of the present invention is to create an engaging element of a fastening device, in particular a rack, that is immediate and easy to use even by a user wearing gloves.

[0014] . Another purpose of the present invention is to provide an engaging element of a fastening device for footwear that is functional but at the same time easy to manufacture and assemble.

[0015] . One not least important purpose of the present invention is to devise an engaging element of a fastening device that achieves the above objective and purposes at competitive costs of production, in such a manner that its use is also advantageous from the economic point of view, and that can be manufactured with the usual well-known plants, machines and equipment.

[0016] . The above objective and purposes, and others that can be better illustrated in the following description, are achieved by an engaging element of a fastening device for sports footwear as defined in claim 1.

BRIEF DESCRIPTION OF THE FIGURES

[0017] . Advantages and characteristics of the invention will become more apparent from the following description, given by way of example without limitations, with reference to the enclosed figures, wherein:

- figure 1 illustrates, in a side view, a sports footwear, in particular a ski boot, that embodies a plurality of fastening devices, some of which embody engaging elements according to the present invention;
- figure 2A illustrates, in a side view, a fastening device comprising an engaging element according to the present invention, in a fastening configuration assumed in the course of the sport practice;
- figure 2B illustrates, in a view from above, the fastening device of figure 2A;
- figure 3A illustrates, in a side view, the fastening device of figures 2A and 2B, in a release configuration;
- figure 3B illustrates, in a view from above, the fastening device of the previous figures in a walking, or ski-walk, configuration;
- figure 4 illustrates, in a side view, an engaging element according to the present invention;
- figures 5A and 5B illustrate, respectively with a perspective front view and a perspective view from above, an engaging element according to the present invention;
- figure 6 illustrates, in a lateral perspective view, an engaging element according to the present invention, provided with a locking means arranged in a lowered or idle position;
- figure 7 illustrates, in a lateral perspective view, an engaging element according to the present invention, provided with a locking means arranged in a raised or operative position;
- figures 8A and 8B illustrate, according to perspective views respectively lateral and from below, a first variant embodiment of an engaging element according to the present invention;
- figures 9A and 9B illustrate, both in a lateral view, a second variant embodiment of an engaging element according to the present invention, slidable with respect to the surface of the footwear, arranged in two different positions;
- figure 9C illustrates in a perspective view from above, the variant embodiment of figures 9A and 9B;
- figures 10A, 10B and 10C illustrate, in a lateral view, a fastening device embodying an engaging element according to a third variant embodiment of the present invention, respectively in a fastening configuration, in an intermediate step for reaching the walking configuration and in the walking configuration;
- figures 11A, 11B and 11C illustrate, in lateral views, a fastening device embodying an engaging element according to a fourth variant embodiment of the present invention, respectively in a fastening configuration, in an intermediate step for reaching the walking configuration, and in the walking configuration.

DESCRIPTION OF THE PREFERRED EMBODIMENTS OF THE INVENTION

[0018] . In the description which follows, the directional terms such as "above, below, vertical, horizontal, lower

and upper", as well as any other similar terms, will be interpreted with reference to an engaging element of a fastening device for sports footwear when in use, that is, as shown in the enclosed figures.

[0019] . With particular reference to figure 1, a sports footwear 10 is shown, in particular a ski boot, preferably of the type provided with a pair of overlapping or approachable flaps, provided with a plurality of lever-type fastening devices arranged so as to close the boot; among them, at least one fastening device 1, preferably positioned on the cuff of the boot, comprises an engaging element 6 according to the present invention, as will be explained below in greater detail, while the remaining fastening devices, for example positioned on the shell, can include conventional engaging elements.

[0020] . As shown in figures 2A, 2B and 3A, 3B, said fastening device 1 includes advantageously a lever arm 2 articulated to a base 3 fixed to the footwear in correspondence of one of the flaps to be fastened, to which is operatively associated, preferably through a tension member 4 pivoted to the lever arm 2, a hooking element 5.

[0021] . Said support base 3 consists essentially of a flat bottom surface, with which it is connected to the surface of the footwear, and two shoulders 3B opposed to each other, that rise preferably at a right angle from said flat bottom surface and on which is provided a pair of mutually opposing holes which make it possible to articulate said lever arm 2 in the space between said shoulders 3B and around a transversal axis 3A, defined by a pin.

[0022] . In particular, said lever arm 2 is rotatably movable around said pin 3A and can assume at least one stable tensioning position (figures 2A, 2B), in which it is preferably arranged substantially contacting the surface of the footwear 10, and a release position (figure 3A), in which it is substantially raised from the surface of the footwear 10.

[0023] . Preferably, said hooking element 5 comprises an elongated body, preferably metallic, substantially U-shaped, to form a transversal engaging portion 5A from which branch off two parallel arms 5B provided with two free ends 5C, with which said hooking element 5 is rotatably connected to said tension member 4.

[0024] . An engaging element 6 according to the present invention is instead connected to the opposite flap of the footwear, and is configured so as to cooperate with said hooking element 5 to fasten the footwear.

[0025] . In particular, advantageously, said engaging element 6 comprises a rack, formed by a rigid and preferably elongated body 60, extending in a main direction of elongation between a first end portion 61 and a second end portion 62, and substantially flat or perhaps slightly curved to better adapt to the external surface of the footwear with which it is associated.

[0026] . Said rack 6 is provided with engaging means 6A essentially consisting of a toothing formed by a plurality of teeth advantageously projecting from the upper surface of said body 60 and arranged in sequence. Pref-

erably, said teeth are arranged evenly spaced and extend substantially transversal to the main extension of the rack 6.

[0027] . Advantageously, said toothing 6A is suitable to cooperate with said hooking element 5 to fasten the footwear. Specifically, between pairs of adjacent engaging teeth are formed corresponding engagement seats 6B, advantageously configured to removably accommodate the transversal portion 5A of the hooking element 5, holding it engaged in the selected position based on the desired fastening force.

[0028] . Said rack 6 can be fixed directly on the surface of the corresponding flap of the sports footwear that is to be fastened through a suitable fastening means, such as a rivet inserted into a through hole 61 A, advantageously provided near said first end portion 61 of the same.

[0029] . As an alternative, as shown in figures 9A, 9B and 9C, a rack 6 according to the present invention can be associated with the flap of said footwear 10 through a suitable base 9, provided with longitudinal seats suitable to cooperate in a known manner with temporary engaging means, selectively activated by the user through appropriate control means 9A, such as for example a push button on the body 60, to allow the longitudinal sliding of the rack 6 relative to the base 9, as indicated by the arrow P, and thus the variation in the position of the same, thus providing a further possibility of adjusting the fastening force offered by the fastening device 1.

[0030] . The operation of the fastening device 1 described hereto is known and conventional: in fact, to properly fasten the footwear 10 to a desired fastening level, said lever arm 2 is first turned to the release position, and then the transversal engaging portion 5A of the hooking element 5 is inserted inside a predetermined engagement seat 6B defined by adjacent teeth of the toothing set 6A formed on said rack 6.

[0031] . Next, by rotating said lever arm 2 around said pin 3A, the user turns it to the tensioning position, pulling in this manner, through the tension member 4, the hooking element 5 which is held engaged by the rack 6; this consequently determines the mutual approach or overlapping of the two flaps of the footwear to which said lever arm 2 and said rack 6 are connected, thus closing the footwear 10 with the desired fastening force, defined advantageously by the engagement position of the hooking element 5 on the rack 6.

[0032] . During the actual sport practice, the footwear should be firmly fastened by its fastening devices so as to guarantee an immediate and optimum transmission of stresses, preventing in particular the cuff of the footwear to oscillate with respect to the shell of the same.

[0033] . Advantageously, in this fastening configuration, the hooking element 5 is held securely engaged in the selected seat 6B of the rack 6, thanks to the intense traction exercised by the lever arm 2, which prevents its accidental disengagement.

[0034] . To open the footwear 10, the lever arm 2 is turned to the release position, in which, thanks to the

decreased traction applied, the transversal engaging portion 5A of the hooking element 5 on the toothing 6A of the rack 6 can be disengaged, and consequently the two opposite flaps of the footwear 10 are free to part and thus allow the user to extract the foot from the footwear.

[0035] . Moreover, advantageously, a fastening device 1 can assume a suitable configuration and allow the effortless walking of the user when not using the skis, generally known as ski-walk configuration.

[0036] . In this configuration, the hooking element 5 is engaged in a seat 6B of the toothing 6A located advantageously closer to the lever arm 2 than the seat engaged in the configuration adopted during the sport practice, and the lever arm 2 is preferably arranged in the tensioning position; in this manner, the cuff of the sports footwear is allowed a certain oscillatory movement, as shown by the arrows F in figure 1.

[0037] . As shown in the enclosed figures, and with particular reference to figures 4, 5A and 5B, according to an advantageous characteristic of the present invention said rack 6 also comprises a locking means 7, preferably formed with a substantially thread-like element bent or shaped essentially as a U-shaped element, and articulated to the body 60 of said rack 6 so as to be rotatably moved, as shown by the arrows A of figure 4, between a lowered position, in which it extends around the body 60 of said rack 6, surrounding it at least partly, and lower with respect to said toothing 6A so as not to interfere with said hooking element 5, and a raised or operative position, in which it cooperates with said hooking element 5, holding it in a selected position based on the desired fastening degree of the footwear 10, as explained later in greater detail, advantageously when the fastening device 1 is in the ski-walk configuration.

[0038] . Preferably, said locking means 7 is configured so as to have a transversal end portion 7A wherein are connected a pair of pivot arms 7B, each provided with a respective free end 7C whereby said locking means 7 is rotatably connected to said body 60 of the rack 6, advantageously in correspondence of or in proximity of said first end portion 61 of the same, that is, the end located, when in use, at a greater distance with respect to the position of the lever arm 2.

[0039] . Advantageously, said pivot arms 7B extend essentially parallel to each other lying, when in use, along the lateral edges of the body 60 of the rack 6; in particular, said pivot arms 7B are dimensioned such that said end portion 7A positions itself beyond said second end portion 62 of said body 60.

[0040] . Said rack 6 is thus provided, on opposite side edge portions, with a pair of pivot holes 71, 72 that extend transversally with respect to the longitudinal extension of the rack 6, and are suitable to accommodate the free end portions 7C of said locking means 7.

[0041] . As can be seen in particular in figure 5B, said pivot holes 71, 72 can be arranged on opposite sides of said body 60 and can extend along substantially parallel axes; in this case, therefore, the arms of said pair of pivot

arms 7B will be of different length. In this case, advantageously, the particular shape of the locking means 7 generates an elastic biasing force that elastically opposes the rotational movement from the lowered position to the raised position, forcing it constantly toward the lowered position.

[0042] . Alternatively, said pair of pivot holes 71, 72 can be arranged so as to be coaxial, and consequently said pivot arms 7B will have substantially the same length; in this case, preferably, the elastic biasing force is provided by suitable elastic biasing means, such as for example a pair of torsion springs inserted into said pair of holes 71, 72 and configured to bias said locking means 7 toward the lowered position.

[0043] . If necessary, to allow a greater flexibility in assembling the locking means 7 on said rack 6, a first pair of pivot holes 71, 71' and a second pair of pivot holes 72, 72' can be provided, each formed by coaxial holes made on opposite edge portions of said body 60, said pairs extending advantageously along mutually parallel axes and substantially transversal to the main extension of said rack 6.

[0044] . The operation of said locking means 7 in a lever-type fastening device 1 is described with reference to figures 6 and 7; when the fastening device 1 is in the fastening configuration, the hooking element 5 is positioned so that the relative engaging portion 5A is engaged in a preselected seat 6B of the toothing 6A of the rack 6 depending on the desired fastening force, which is reached by applying a certain traction in a conventional manner on said lever arm 2, as previously explained, in other words by rotating the latter from the initial release position to the tensioning position.

[0045] . As mentioned, in the fastening configuration the position of the hooking element 5 is firmly maintained thanks to the intense traction force exerted by the lever arm 2, and thus it is rather difficult or impossible to have the toothing 6A of the rack 6 becoming accidentally disengaged; advantageously, said locking means 7 is conveniently arranged in the lowered or idle position, as it is not involved in the fastening action imposed by the device 1 (figure 6).

[0046] . If the fastening device 1 is to be used desirably in a ski-walk condition, that is, a condition that allows a certain oscillation of the cuff of the footwear 10 to allow the walking of the user when not wearing skis, it is necessary to disconnect the hooking element 5 of the toothing 6A by repositioning the transversal engaging portion 5A on an engagement seat 6B nearer to the lever arm 2, in such a way as to maintain a minimum fastening force, although loosened compared to the fastening force applied during the sports practice.

[0047] . Advantageously, before performing this operation, the hooking element 5 is momentarily detached from the toothing 6A, then rotatably moving said locking means 7 from its current lowered position to the raised position, in opposition to the elastic biasing force generated by any elastic means or by its own configuration.

[0048] . At this point the user, maintaining said locking means 7 in the raised position, approaches the hooking element 5 again to the toothing 6A, arranges said engaging portion 5A in the most suitable seat 6B for the ski-walk condition, and rotates the lever arm 2 to return it to the tensioning position, that is, contiguous to the surface of the footwear 10 so as to avoid damaging the lever arm during the ambling-walk, as shown in figure 3B; clearly, in this phase the traction force applied on the hooking element 5 by the lever arm 2 has a lower intensity than the force generated during the sport practice.

[0049] . When the locking means 7 is released from its raised position, the locking means is brought back toward the lowered position by the elastic biasing force, overlapping in this manner the hooking element 5 and holding it advantageously engaged in the selected position, thus avoiding the possibility that the stresses created by the user during walking cause the accidental disengagement of the hooking element 5 from the toothing 6A of the rack 6, and result in the unwanted opening of the footwear 10 (figure 7).

[0050] . According to a further advantageous characteristic of the present invention, said rack 6 is also provided with abutting means 8, suitable to cooperate with said locking means 7 to determine the stop end of the rotating movement when said locking means reaches the lowered or idle position.

[0051] . As shown in figures 5A and 5B, said abutting means 8 preferably comprise a pair of flat fins projecting from opposite side edge portions of the body 60 of said rack 6, preferably near the first end 61 of the same and lower than the position of said pivot holes 71, 72.

[0052] . In this manner, advantageously, the moment in which said pivot arms 7B collide with a respective fin of said pair of flat fins 8, a further rotation of the locking means 7 is inhibited thus indicating that the lowered position has been reached.

[0053] . Figures 8A and 8B illustrate a first variant embodiment of an engaging element 6 according to the present invention, in which, unlike the previous embodiment, said abutment means 8 are formed by a single fin axially projecting from the body 60 of said rack 6 at the second end portion 62, and are suitable to interfere in abutment with said transversal end portion 7A of the locking means 7 to determine the lowered position.

[0054] . This variant embodiment is rather advantageous since said abutment fin 8 is axial with the body 60, and thus it is made in a simple manner by the same extruder die from which the rack 6 is made, without waste of material.

[0055] . If necessary, as shown in the variant embodiment shown in figures 10A - 10C, the end portion 7A of said locking means 7 can be bent or shaped so as to define a concavity 70, advantageously turned outwards, when in use, that is, from the opposite side with respect to the surface of the footwear 10 with which the footwear 1 is associated, and configured such as to form an additional engagement seat for said hooking element 5 in

addition to the ones defined by the toothing 6A of the engaging element 6, advantageously external to the body 60.

[0056] . This characteristic is advantageous, in particular when the fastening device 1 is in a ski-walk configuration, offering in fact an additional possibility of adjustment of the fastening tightness.

[0057] . Advantageously, said rack 6 can also be provided with detaining means 63 configured so as to prevent the possibility that, when said fastening device 1 assumes the ski-walk configuration, the hooking element 5 comes out of the concavity 70; for example, said detaining means 63 can advantageously be formed by an appendage 63 jutting outward from the last tooth of said toothing 6A, that is, the tooth located adjacent to the second end portion 62 of the body 60.

[0058] . Figure 10A illustrates the fastening device 1 embodying said rack 6, arranged in an operative configuration assumed during the sport practice; it can be seen in fact that said locking means 7 is arranged in a lowered position, in abutment against said abutting means 8, which in this case are formed by a pair of lateral fins, and does not interfere with the overlying hooking element 5 arranged in engagement with the toothing 6A and drawn by the lever arm 2 that lies in the tensioning position.

[0059] . Figure 10B illustrates the device 1 of the previous figure in an intermediate phase during the transition to the ski-walk configuration; in particular, said lever arm 2 is rotated to the release position and the hooking element 5 is disengaged from the toothing 6A of the rack 6 and is inserted into the cavity 70 defined by the end portion 7A of the locking element 7.

[0060] . Due to the low tension applied by the lever arm 2, the hooking element 5 is not firmly held in the desired position, and may therefore accidentally detach from the concavity 70, and result in the unwanted opening of the footwear 10.

[0061] . Lastly, figure 10C illustrates the device 1 in the ski-walk configuration: the lever arm is again positioned in the tensioning position and the hooking element 5 is firmly detained, through its engaging portion 5A, in engagement in the concavity 70 defined by said locking means 7, thanks also to the presence of the detaining appendage 63 that prevents its accidental detachment.

[0062] . In this manner, advantageously, the fastening device 1 holds the two flaps of the footwear 1 firmly fastened, even if it applies a fastening force that is definitely lower than the fastening obtained in the operative configuration, and suitable to enable a certain oscillation of the cuff with respect to the shell such as to enable the user to easily walk when momentarily not wearing skis.

[0063] . Similarly, in the variant embodiment illustrated in figures 11A - 11C, the end portion 7A of said locking means 7 is bent or shaped so as to define a concavity 70 turned, when in use, toward the surface of the footwear 10 with which the device 1 is associated, and is configured so as to form an additional engagement seat for said hooking element 5 in addition to the ones defined

by the toothing 6A of the engaging element 6, advantageously external to the body 60.

[0064] . Unlike the embodiment described in figures 10A - 10C, in the case in which said abutment means 8 are formed by a fin axially projecting from the body 60 of the rack 6, it is not necessary to have detaining means 63, since said fin 8, in the ski-walk configuration, closes the concavity 70, preventing the engaging portion 5A of the hooking element 5 engaged therein to accidentally detach, as can be seen in particular in figure 11C.

[0065] . In conclusion, from the above it is evident how the present invention achieves the initially foreseen purposes and advantages. In fact, an engaging element 6 of a fastening device, in particular a rack, was designed for sports footwear, such as makes it possible to maintain in a stable and secure manner the walking condition of a fastening device in which it is integrated.

[0066] . Further, advantageously, an engaging element 6 according to the present invention is rather intuitive and easy to use even by a user wearing gloves.

[0067] . Lastly, it is evident how an engaging element 6 according to the present invention is rather simple and economic to make, also essentially using components that are easy to find and at low cost.

[0068] . Naturally, the present invention is susceptible to many applications, modifications or variants without thereby departing from the scope of patent protection, as defined by the enclosed claims. In addition, the materials and equipment used to implement the present invention, as well as the shapes and dimensions of the individual components may be the most suitable to meet the specific requirements.

Claims

- Engaging element (6) of a lever-type fastening device (1) of a sports footwear, comprising a rack (6) formed by an elongated body (60), extending between a first and a second end portion (61, 62) and provided with an engaging toothing (6A) comprising a plurality of teeth adapted to be selectively engaged by a hooking element (5) of said lever-type fastening device (1) to fasten said sports footwear, **characterized in that** said rack (6) further comprises locking means (7) formed by an essentially U-shaped thread-like element articulated to said rack (6), said locking means (7) being adapted to be rotatably displaced between a lowered position, wherein it extends around said body (60) of said rack (6) surrounding it at least partially, and is arranged below said teeth (6A) so as not to interfere with said hooking element (5), and a raised position, wherein said locking means (7) is adapted to cooperate with said hooking element (5) so as to keep it in a desired position.
- Engaging element (6) according to claim 1, wherein said locking means comprises a transverse end por-

tion (7A) connected to a pair of parallel pivot arms (7B), each provided with a respective free end portion (7C) whereby said locking means (7) is rotatably associable with said body (60) of said rack (6).

3. Engaging element (6) according to claim 2, wherein said pair of pivot arms (7B) have different lengths, being rotatably associated with said body (60) by accommodating said free end portions (7C) into a corresponding pair of pivot holes (71, 72) obtained on opposite side edge portions of said body (60) and extending along parallel and transversal axes with respect to the extension of said rack (6). 5 10
4. Engaging element (6) according to claim 2, wherein said pivot arms (7B) have the same length, being rotatably associated with said body (60) by accommodating said free end portions (7C) into a corresponding pair of pivot holes (71, 72) coaxially obtained on opposite side edge portions of said body (60), elastic biasing means being provided for biasing said locking means (7) in said lowered position. 15 20
5. Engaging element (6) according to any one of claims 2 to 4, comprising abutting means (8) formed by a pair of flat fins projecting from opposite side edge portions of said body (60) and arranged so as to interfere with said pair of pivot arms (7B) for determining the stop end of the rotating movement when said locking means (7) reaches the lowered position. 25 30
6. Engaging element (6) according to any one of claims 2 to 4, comprising abutting means (8) formed by a tab projecting axially from said body (60) in correspondence of said second end portion (62) and adapted to interfere with said transverse end portion (7A) of said locking means (7) for determining the stop end of the rotating movement when said locking means (7) reaches the lowered position. 35 40
7. Engaging element (6) according to any one of claims 1 to 6, slidably associable with a flap of said footwear (10) by means of a mounting base (9) provided with longitudinal seats configured so as to cooperate with temporary engaging means provided on said body (60) and selectively operated through control means (9A). 45
8. Engaging element (6) according to any one of claims 2 to 7, wherein said transverse end portion (7A) of said locking means (7) is shaped so as to form a concavity (70) adapted to provide a further engagement seat arranged outside said body (60) for said hooking element (5). 50 55
9. Lever-type fastening device (1) of a sports footwear (10) comprising an engaging element (6) according to any one of the preceding claims and a lever arm

(2) articulated to a base (3) and operatively associated with a hooking element (5) adapted to cooperate with said engaging element (6) to fasten said footwear (10).

10. Footwear (10) comprising an engaging element (6) according to any one of claims 1 to 8.

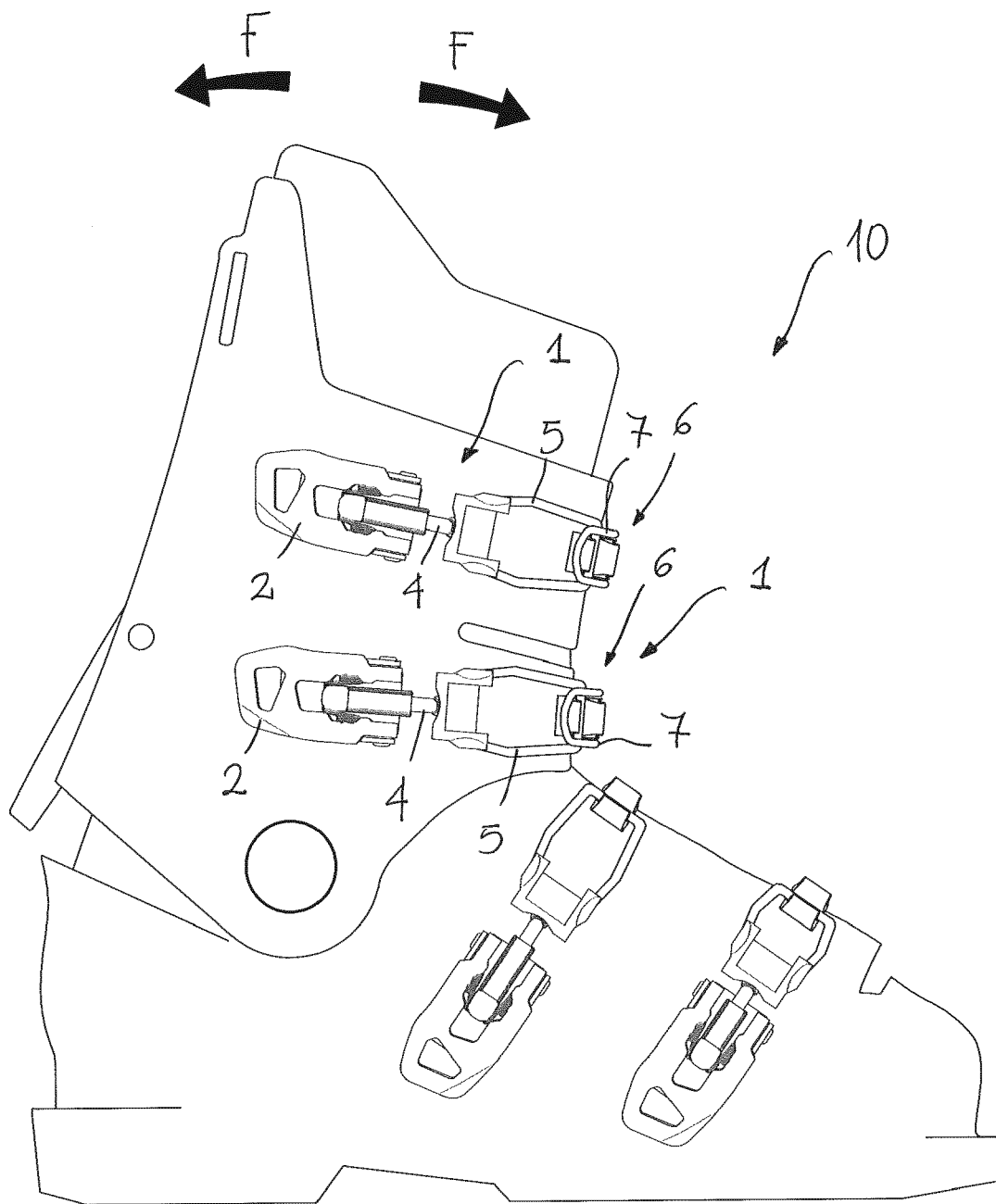


Fig. 1

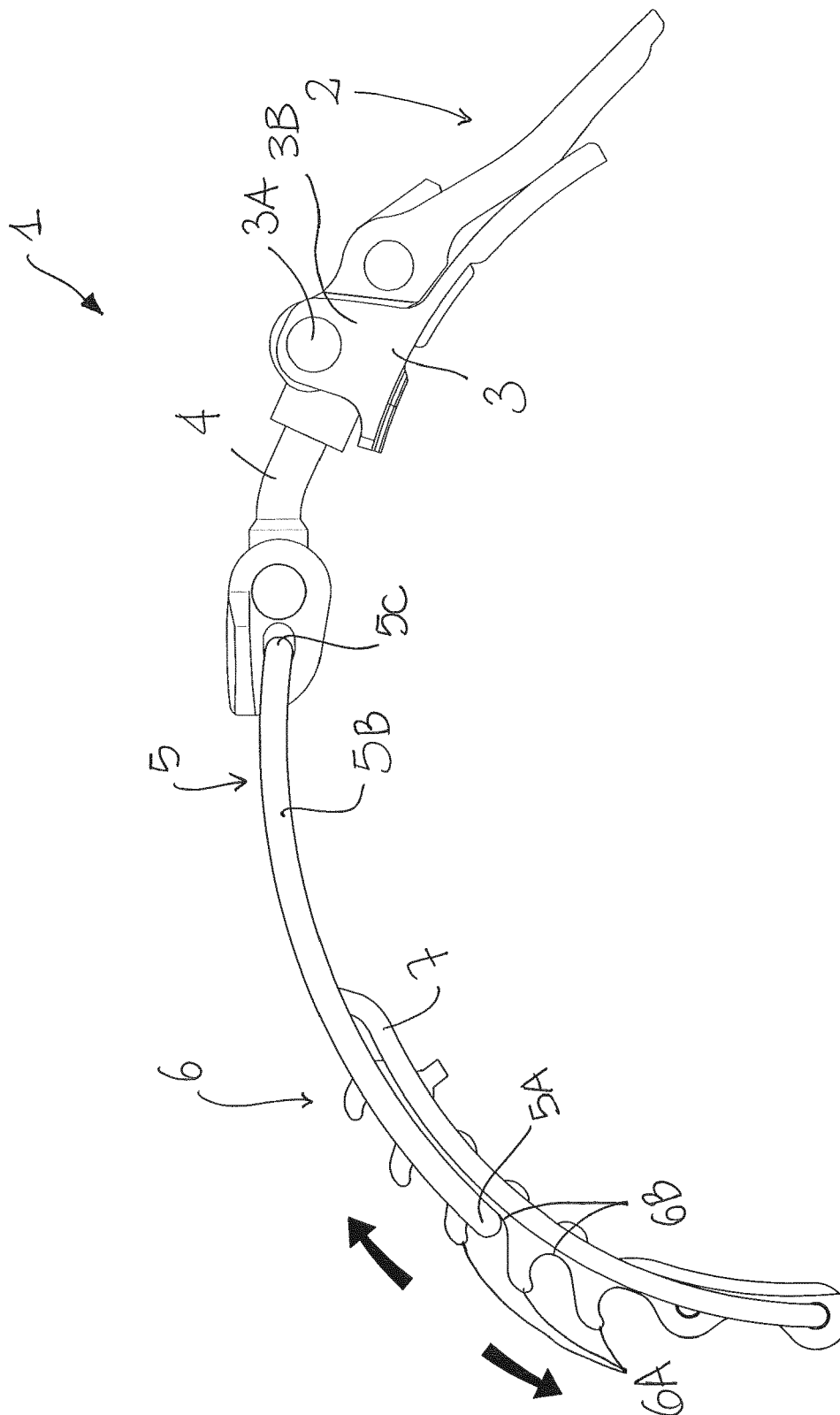


Fig. 2A

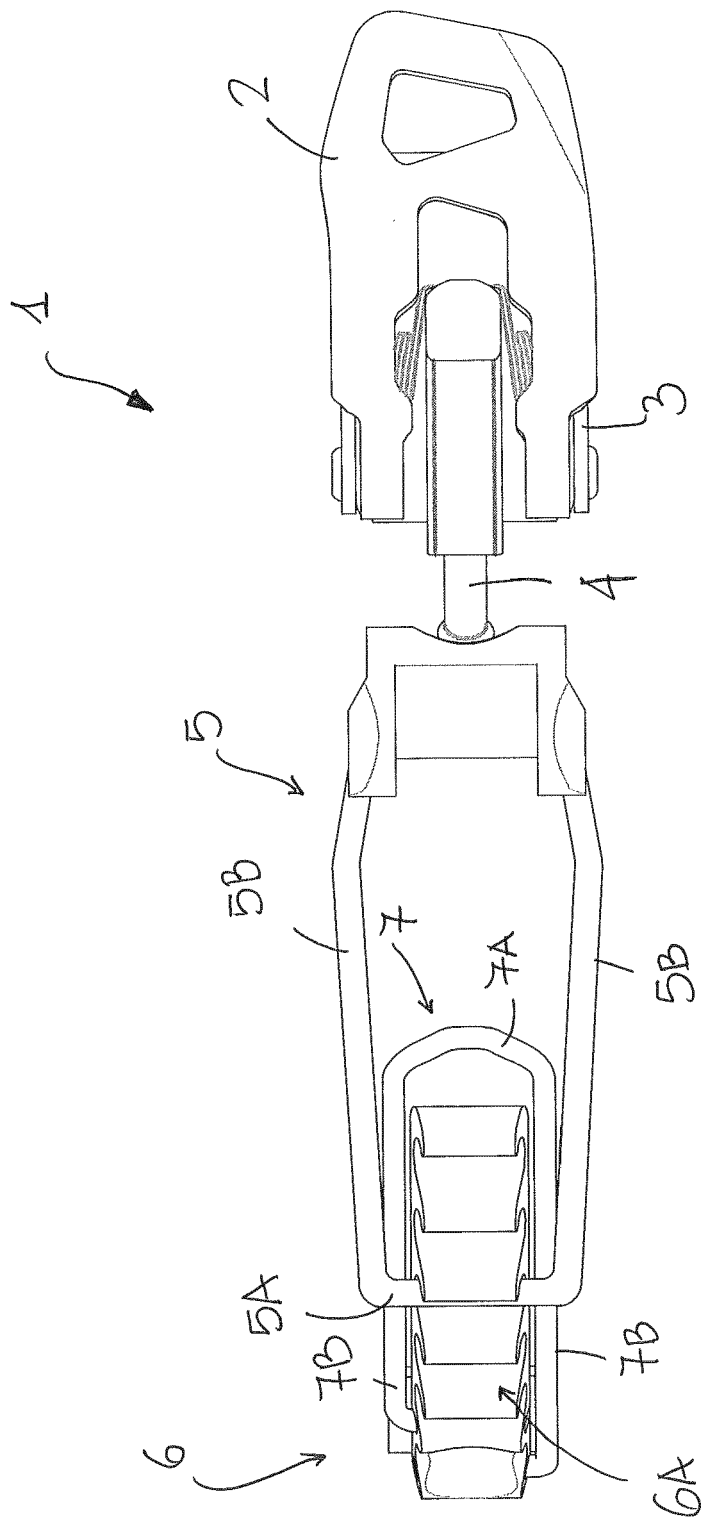


FIG. 2B

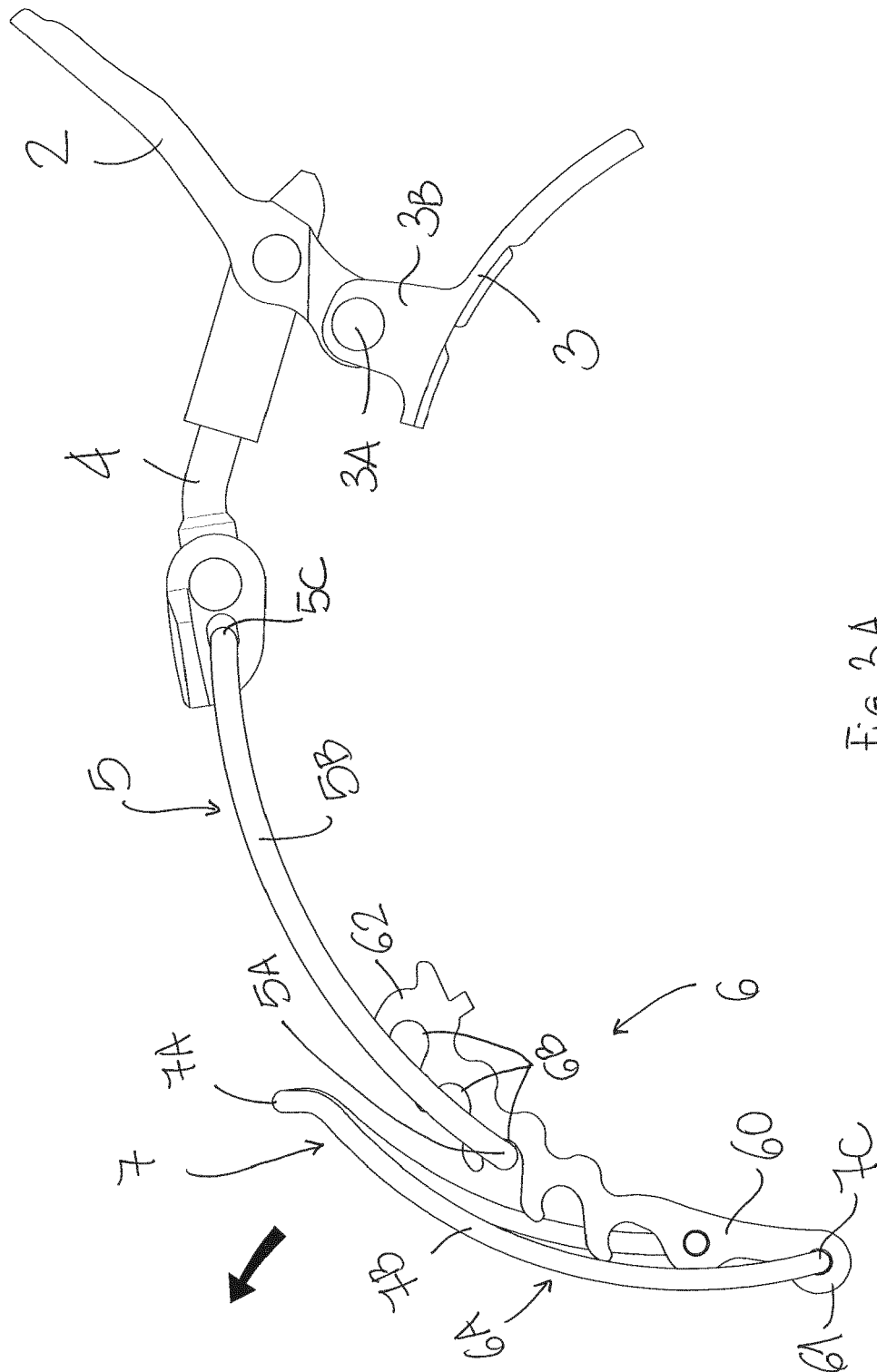
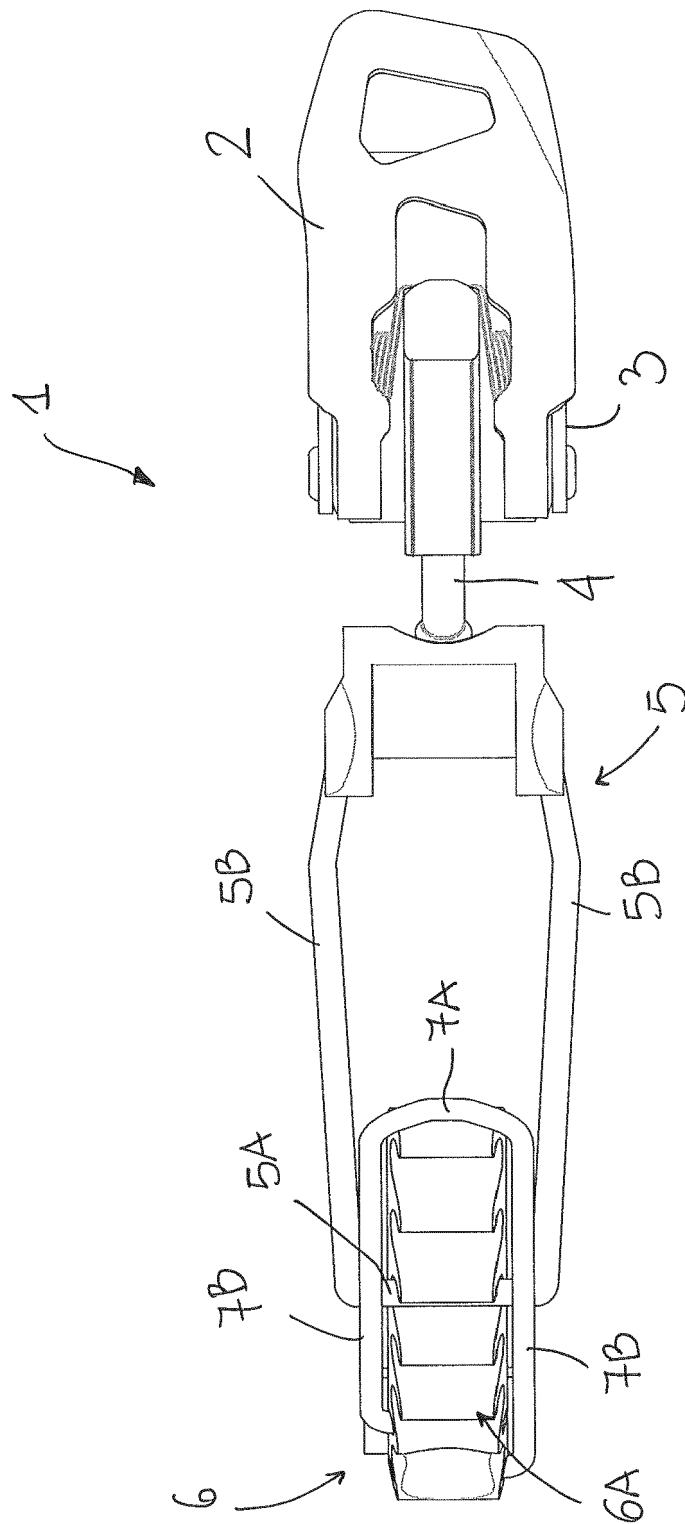


Fig. 3A



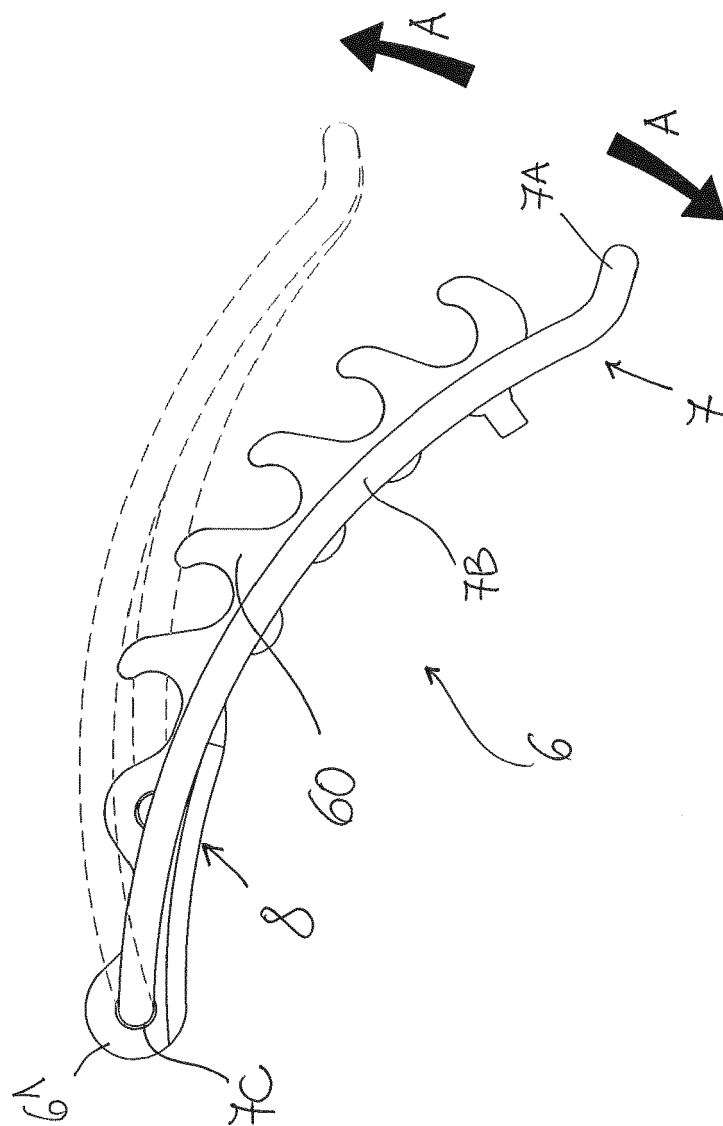


Fig. 4

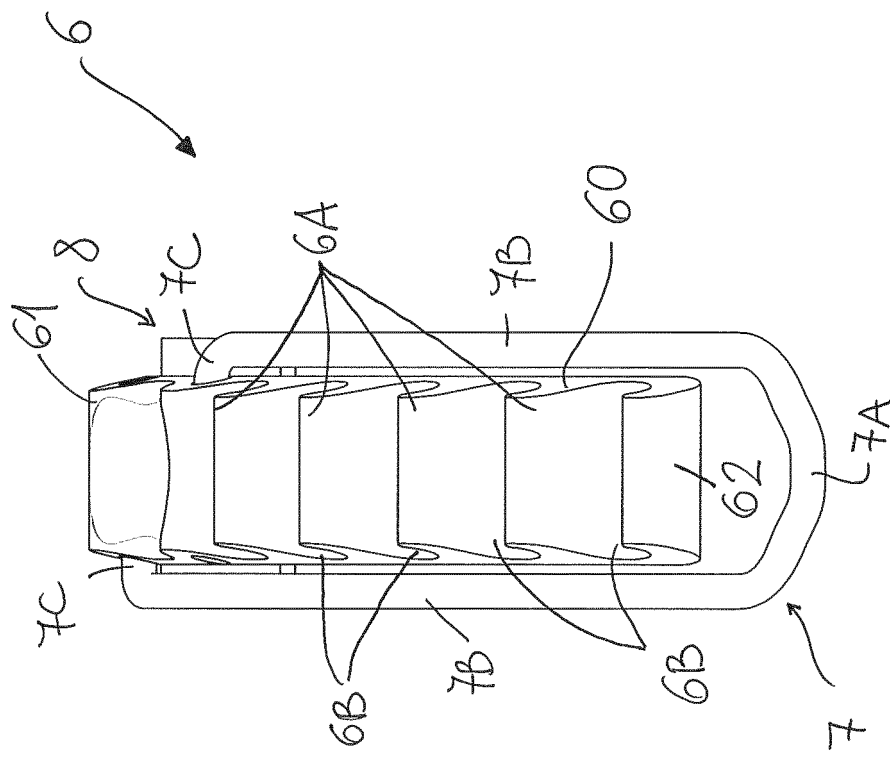


FIG. 5A

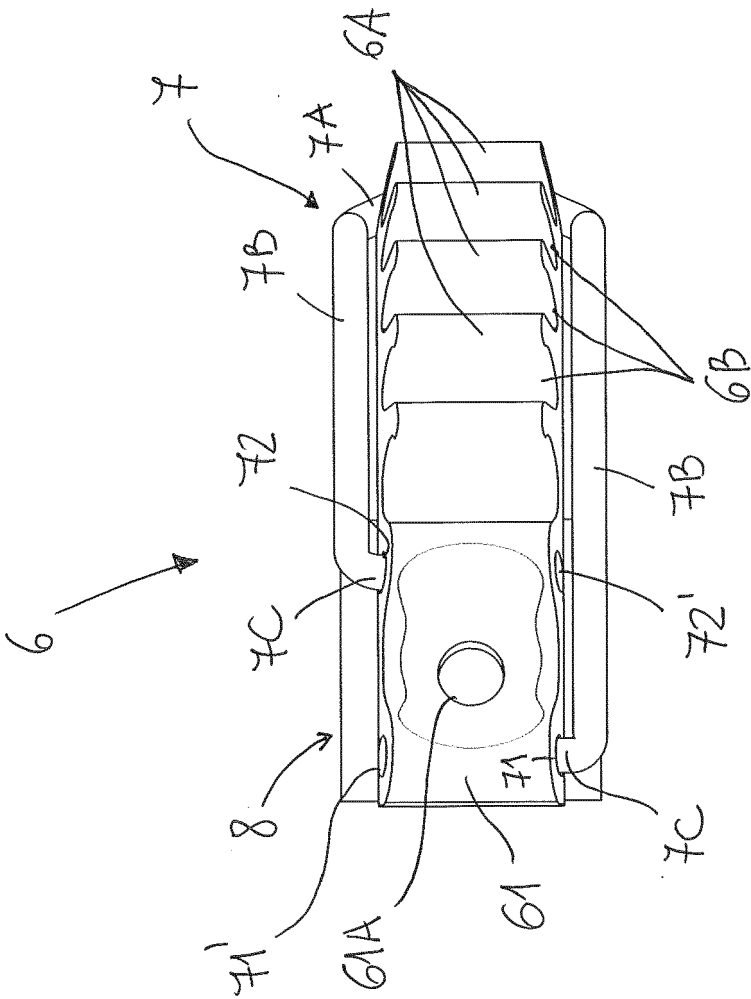


Fig. 5B

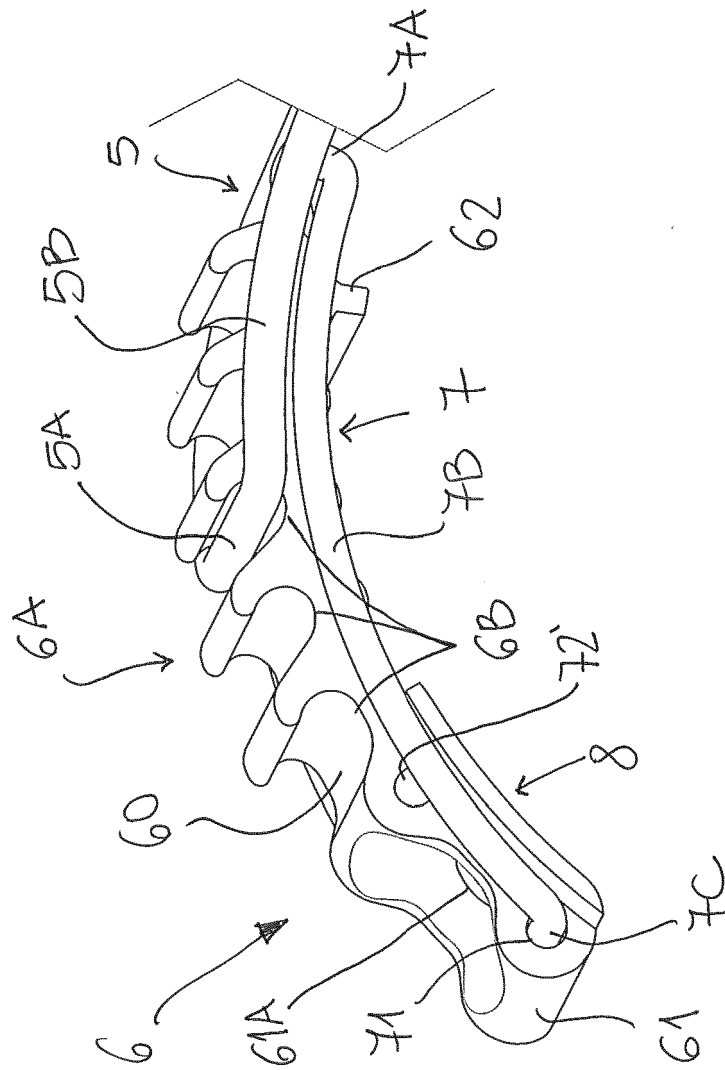


Fig. 6

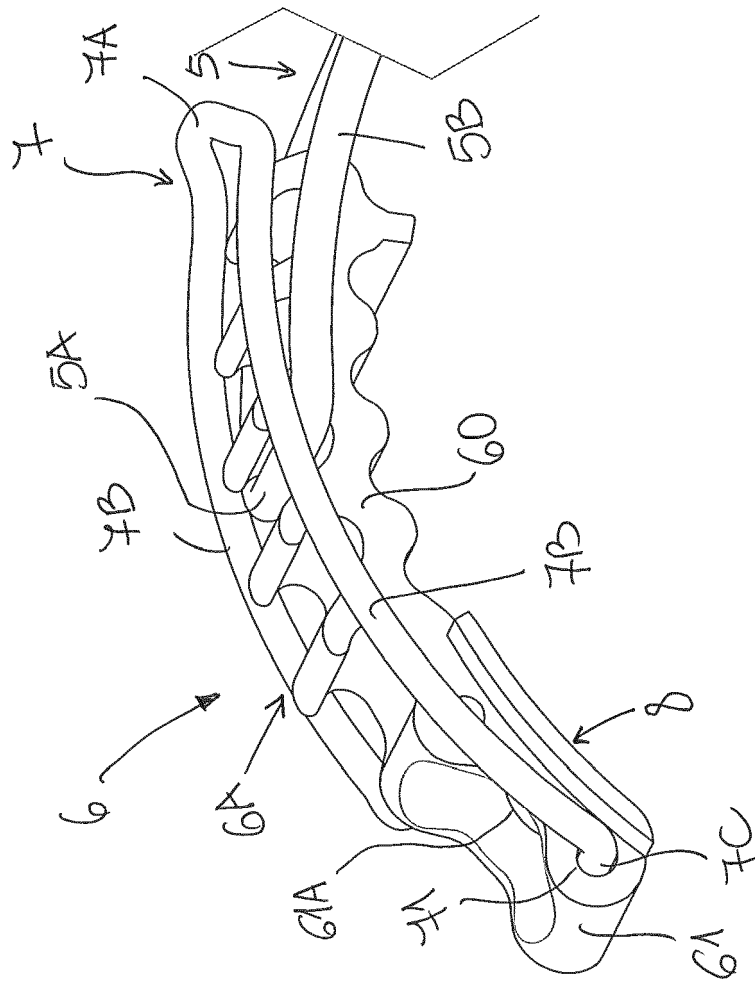


Fig. 7

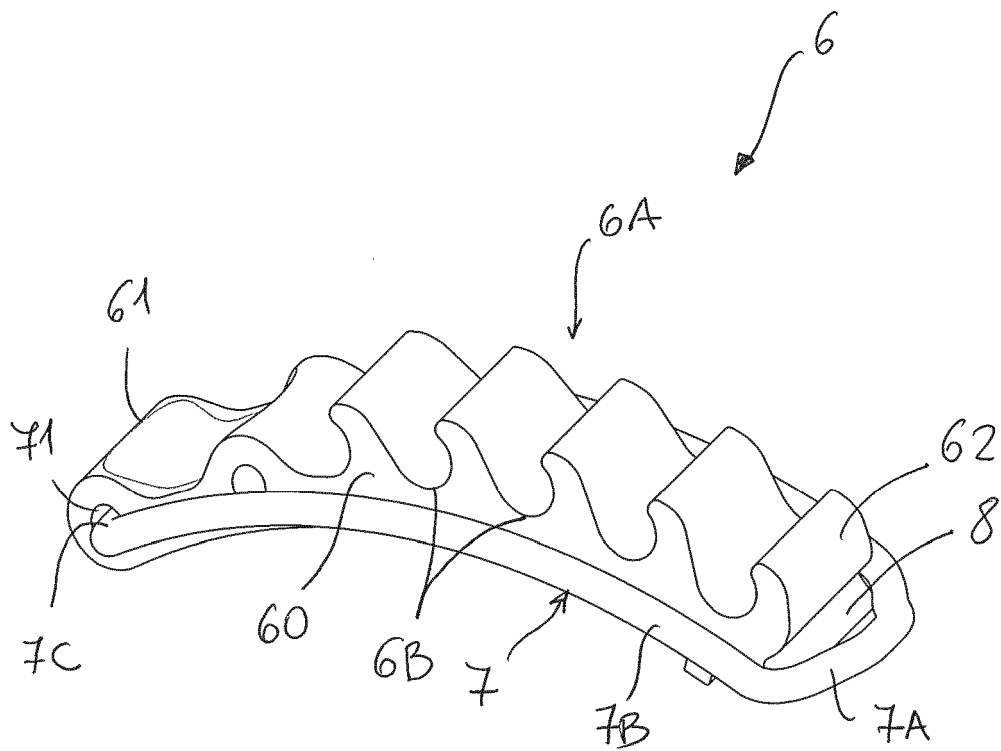
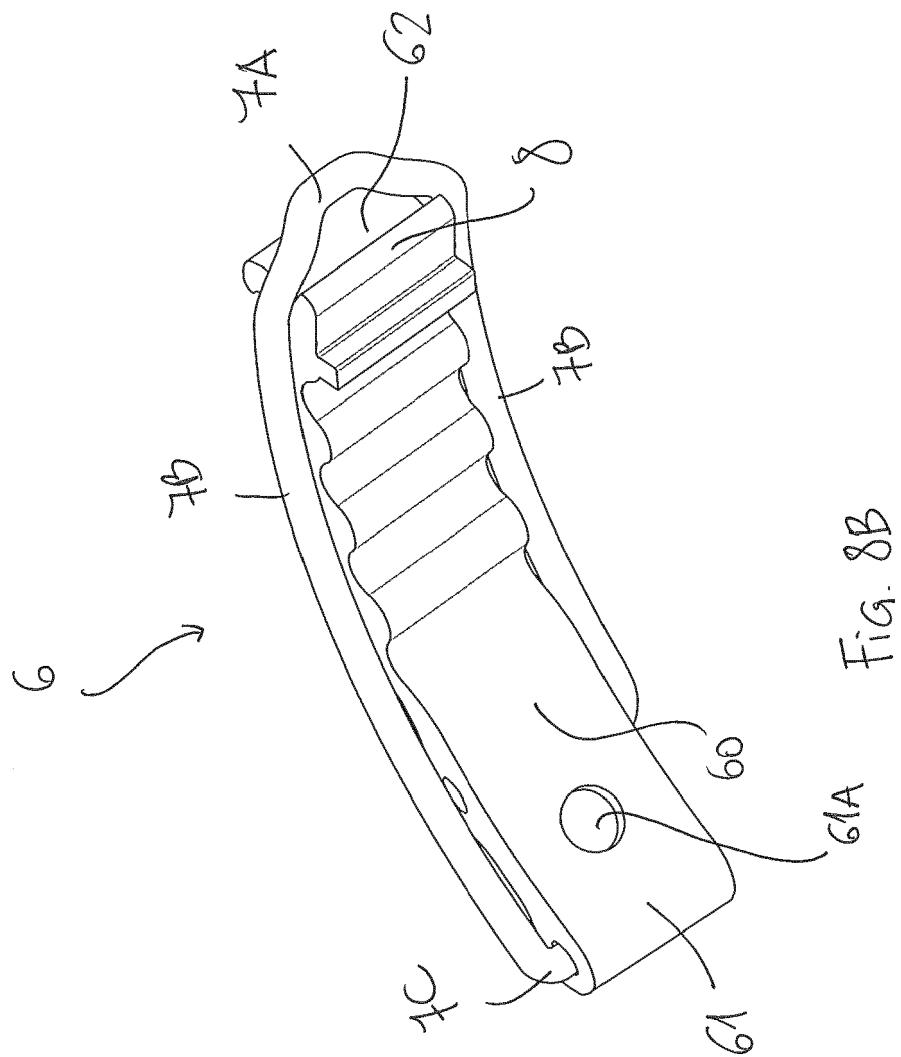
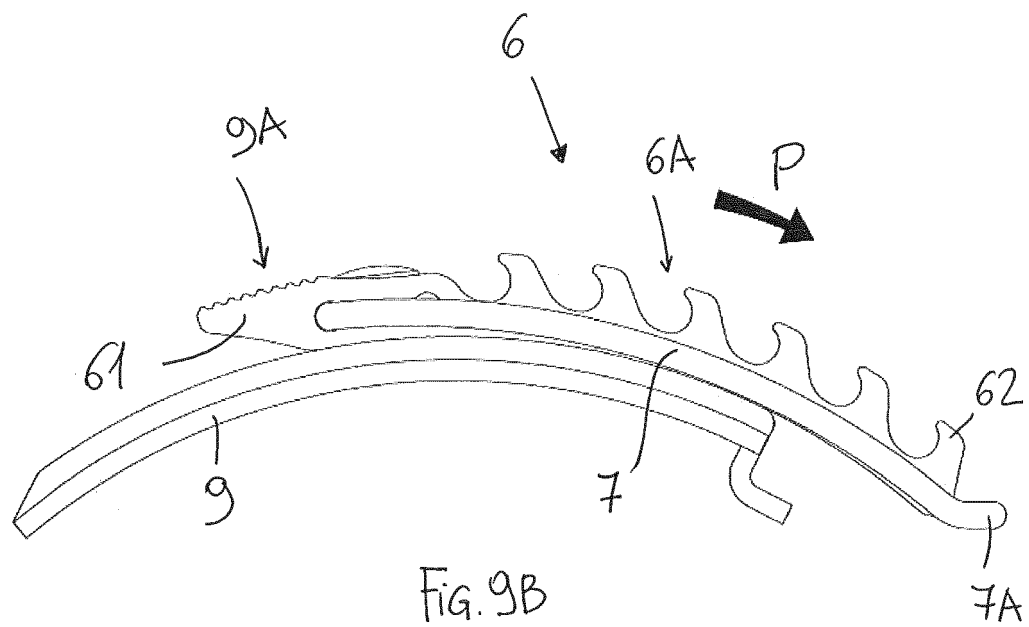
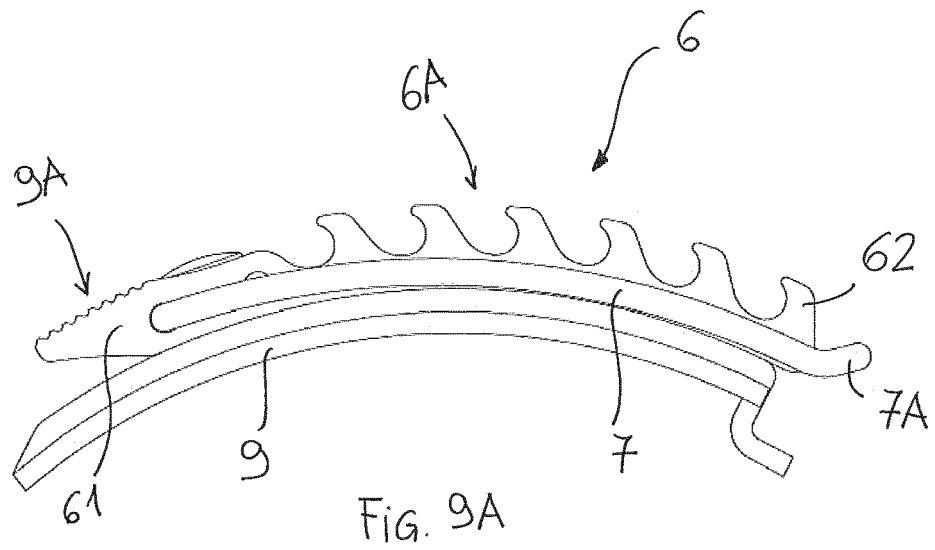


Fig. 8A





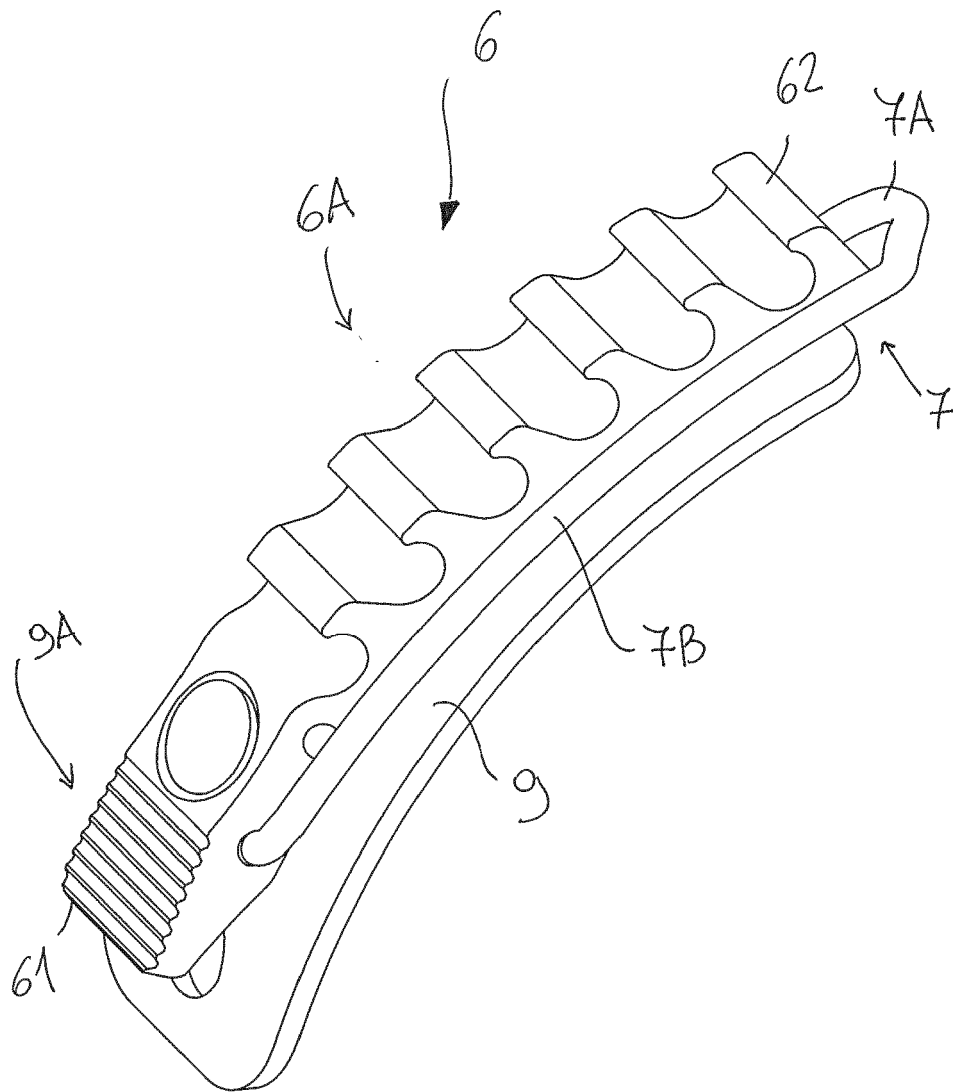
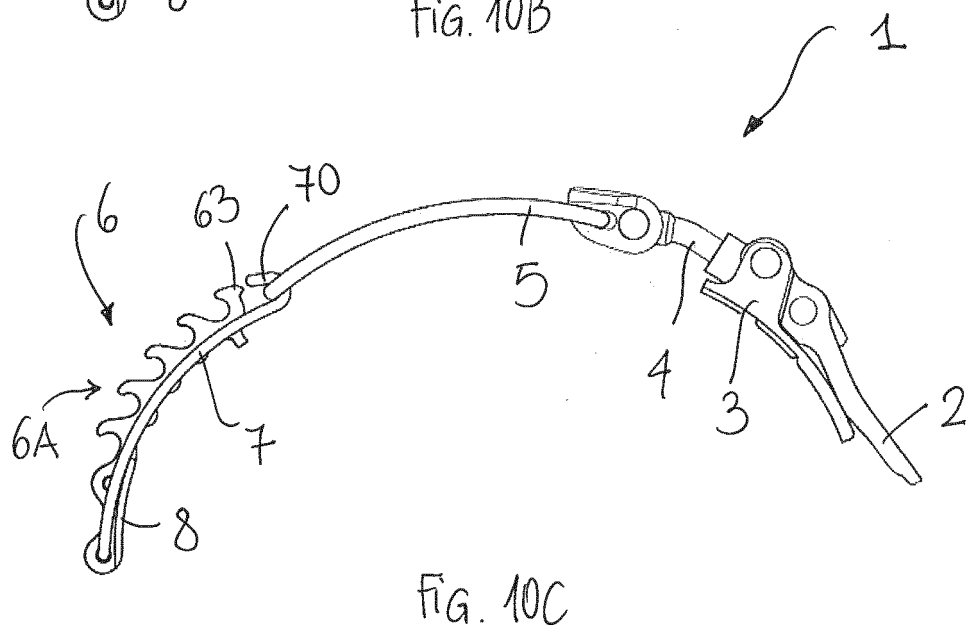
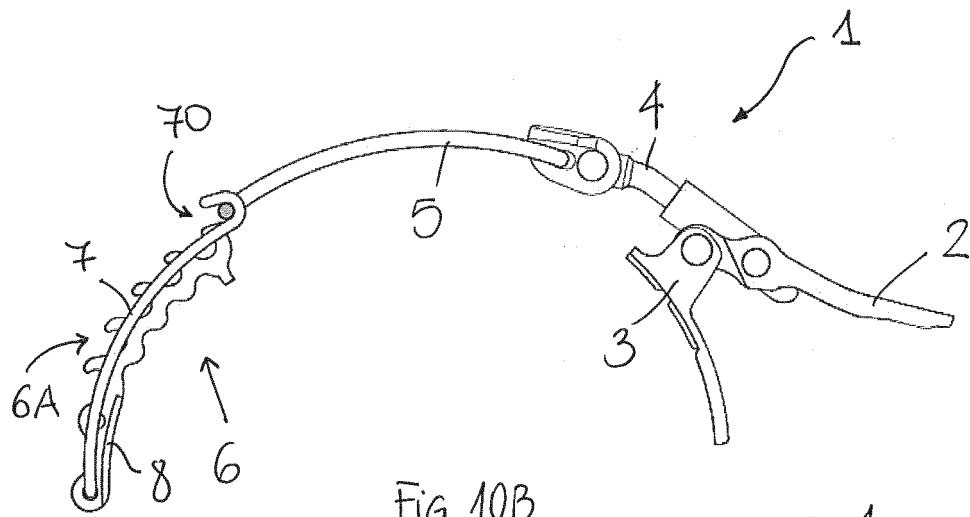
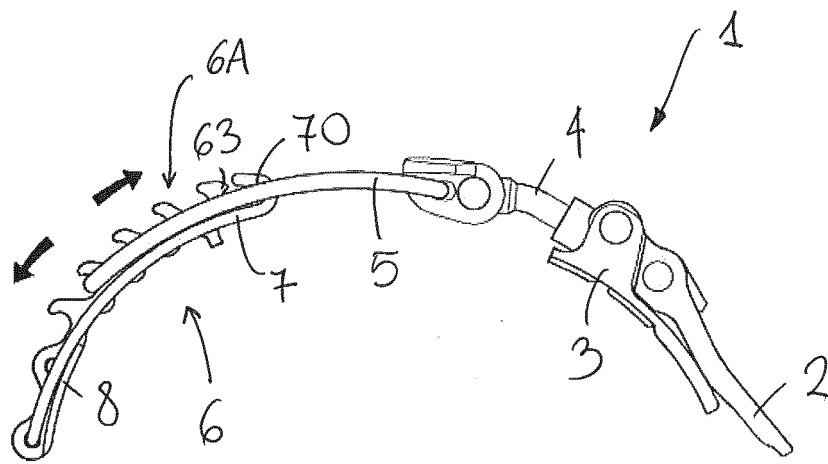
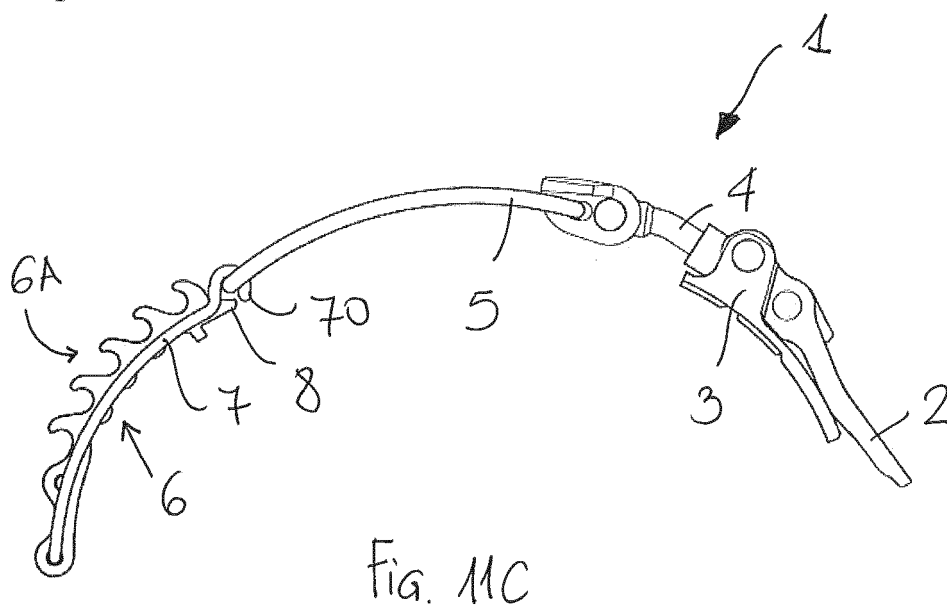
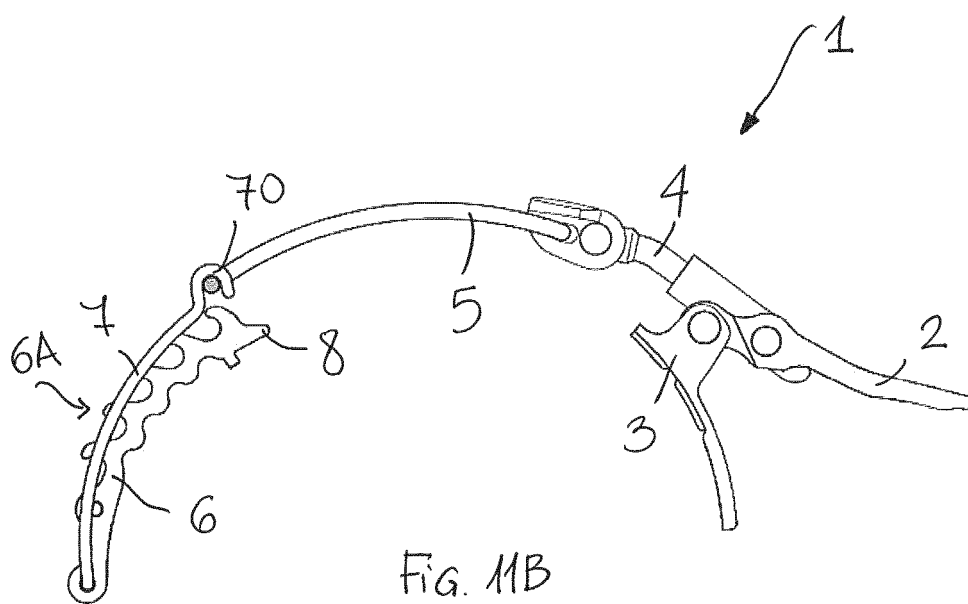
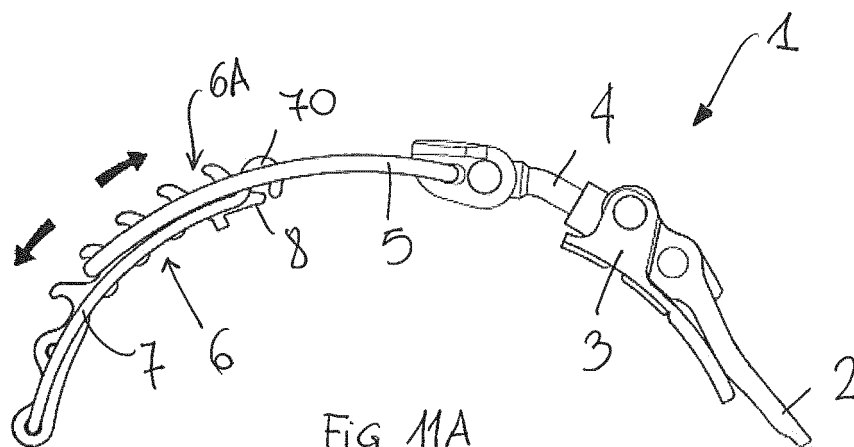


Fig. 9C







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